

Notice of Allowability

Application No.

09/941,418

Applicant(s)

KARLQUIST, RICHARD K.

Examiner

Matthew W. Genack

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 17 February 2006.
2. ☒ The allowed claim(s) is/are 1-26.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

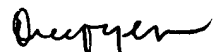
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.


DUC NGUYEN
PRIMARY EXAMINER

DETAILED ACTION

1. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

Allowable Subject Matter

2. Claims 1-26 are allowed.

Regarding Claims 1, 6, 11, and 19, Muterspaugh, U.S. Patent No. 5,157,786, discloses a biasing network for a balanced mixer, wherein said mixer includes either one or two pairs of switching type diodes, said biasing network resulting in the voltage across the mixer diodes being slightly lower than the threshold voltage for conduction, and the mixer accepts an input from a local oscillator (LO) and also a signal, labeled RF, and outputs a signal labeled IF (Abstract, Column 2 Lines 12-26, Column 5 Lines 35-40, Column 9 Lines 6-10, Figs. 1-3). Since mixers can be used to up-convert signals as well as to down-convert signals, these labels are arbitrary, and the input, RF, may be of lower frequency than the output, IF, if the mixer is used to up-convert an input RF signal; one could adopt the convention that RF is of higher frequency than IF, in which case the labels would be reversed when the mixer of Muterspaugh's is used as an up-converter. The use of DC biasing with the mixer diodes results in improved mixer performance (Abstract, Column 6 Lines 28-41), and also allows for an LO amplitude less than the diode turn on voltage of 0.3 Volts (Abstract, Column 6 Lines 63-68, Column 7 Lines 64-66, Fig. 4). The sum of the DC bias voltage and the LO drive periodically turns on the mixer diodes (Column 5 Lines 19-31).

Muterspaugh does not expressly disclose reciprocal conversion between mixer down-conversion and up-conversion, nor does Muterspaugh expressly disclose the practice of providing each mixer diode with a separate DC bias.

Clark *et. al.* discloses a three-pair measurement method involving the determination of amplitude and phase information associated with frequency translating devices, mixers, that are a part of the three-pair, wherein one element of said three-pair, TM1, is used as down-converter in one measurement step and as an up-converter in another measurement step (Abstract, Column 3 Lines 1-31, Figs. 1-4). Clark teaches the need for improved mixer performance in the form of reciprocal conversion response for a mixer that is used in a three-pair measurement method (Clark *et. al.*: Column 2 Lines 19-27). However, Clark *et. al.* does not expressly disclose the attainment of a reciprocal conversion response by controlling the excitation of parasitic voltage-controlled capacitance of the mixer diode(s).

Ishikawa *et. al.*, U.S. Patent No. 5,920,245 discloses a nonradiative dielectric line, with a circuit board positioned parallel to the two conductor plates, said circuit board containing a varactor diode and a Gunn diode (Abstract, Column 2 Lines 35-65, Column 7 Line 43 to Column 8 Line 2, Figs. 1-5). Separate sources of DC bias are provided for the varactor diode and the Gunn diode (Column 8 Lines 3-47, Figs. 6-8). However, this embodiment of Ishikawa *et. al.* is not used for mixing signals (rather, it is used to achieve oscillations), nor is it expressly disclosed that this embodiment entails deliberate adjustments of the parasitic voltage-controlled capacitance of the two diodes.

No combination of Muterspaugh, Clark *et. al.*, and Ishikawa *et. al.* results in every limitation of Claims 1, 6, 11, and 19. Each of the remaining Claims are dependent on one of Claims 1, 6, 11, or 19. Therefore, Claims 1-26 are allowable over the prior art.

Response to Arguments

3. Applicant's arguments, filed 17 February 2006, with respect to Claims 1-26 have been fully considered and are persuasive.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew W. Genack whose telephone number is 571-272-7541. The examiner can normally be reached on FLEX.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc Nguyen can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-7541.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit: 2645

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Matthew Genack

Examiner

TC-2600, Division 2617

A handwritten signature in cursive script, reading "Matthew Genack".

11 May 2006